**EMERALD ROYAL INTERNATIONAL SCHOOL, MPAPE ABUJA**

**LESSON PLAN AND NOTE FOR WEEK 6 ENDING FRIDAY, 16TH FEBRUARY, 2024**

**TERM: SECOND**

**WEEK: WEEK 6**

**DATE : 12TH - 16TH FEBRUARY, 2024**

**SUBJECT: CHEMISTRY**

**TOPIC: GAS LAW**

**SUB - TOPIC: 1. Boyle's law.**

1. **Charles law.**
2. **Standard temperature and pressure( s.t.p)**

**PERIOD : 5th**

**TIME : 11:10 -11:50**

**DURATION : 40 minutes**

**CLASS : SS1**

**NUMBER IN CLASS: 7**

**AVERAGE AGE : 14 years**

**SEX: mixed**

**LEARNING OBJECTIVES:** by the end of the lesson,the students should be able to;

1. state the Boyle's law.
2. State the Charles law.
3. Explain the standard temperature and pressure.

**RATIONALE:** The students should understand the change of state.

**PREVIOUS KNOWLEDGE:** The students have been taught chemical equation.

**INSTRUCTIONAL MATERIALS:** Chart showing the Boyle's law, Charles law and the general gas equation.

**Reference Material:** New school chemistry for senior secondary schools by Osei- Yaw Ababio.

**LESSON DEVELOPMENT**

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| **STAGES** | **TEACHER’S ACTIVITIES** | **STUDENT’S ACTIVITIES** | **LEARNING POINT** |
| **INTRODUCTION** | The teacher introduces the lesson by reviewing the previous lesson. | The students pay attention. | To arouse the students interest. |
| **PRESENTATION**  **STEP 1** | The teacher states and solve exercises on Boyle's law. | The students pay attention. | To keep them focus. |
| **STEP 2** | The teacher asks the students to state the Charles law. | The students states the Charles law. | To encourage critical thinking |
| **STEP 3** | The teacher states the general gas law and solve exercises on it. | The students pay attention. | To keep them focus. |
| **BOARD SUMMARY** | **GAS LAWS**  **BOYLES LAW** -It states that the volume of a given mass of gas is inversely proportional to its pressure provided that the temperature remains constant.Mathematical stated:V α 1/P, V= K/P where V = Volume at  Pressure, P and K = Mathematical constant  Kinetic Theory Explanation of Boyle's Law  -When volume is decreased or made small, the gas molecules will hit and collide with each other and the walls more frequently, and so the pressure increases.  -When the volume is increase, the gas molecules will hit the walls and collide with each other less frequently, and so the pressure decreases.  **Kinetic Theory Explanation of Boyle's Law**  According to the kinetic theory, increase in pressure is caused by gas molecules hitting the walls of the container more frequently, and a decrease in pressure is caused when gas molecule hit the wall of the container less frequently.  **Kinetic Theory Explanation of Charles’ Law:**  **i)** When the temperature is increased, the gases molecules collide with each other and the walls of the container more frequently. For the pressure to remain constant, the container must expand to prevent an increase in pressure.  **ii)** When the temperature is decreased, the container must contract, or reduce in volume by the movement of the piston so that the rate of collision of the gas molecule is maintained.  Example 1  375cm3 of a gas has a temperature of 700C. Find its volume if the temperature is reduced to 500C.  **GENERAL GAS EQUATION**  The General Gas equation is a combination of Boyle’s law and Charles’ law. The equation provides that the volume of a gas depends on both the temperature and the pressure of the gas. It is mathematically expressed as shown.  V ∞ ⅟p (Boyle’s Law – at constant temperature)  V ∞ T ( Charles’ law—at constant pressure)  V ∞ ⅟p ∞T (both temperature and pressure could vary)  PV = K  T  For any change in pressure, volume, and temperature, a new  Pressure, volume, and temperature are obtained. The formula is therefore given by  P1V1 = P2V2  T1 T2  **Standard Temperature and pressure (STP)**  The volume of gases change markedly with changes in temperature and pressure. Scientists  therefore decided that O degree C or 273K and 760mmHg or 1.01x105Nm-2 or 1 atm (in S.I. units)  should be the standard temperature and pressure (s.t.p.) as gas volumes are given.  **Example 1**  At S.T.P a certain mass of gas occupies a volume 760cm3. Find the temperature at which the gas occupies 1000cm3 and has a pressure of 726mmHg.  SOLUTION  P1V1 = P2V2/  T1 T2  P1 = 760mmHg (S.P.)  T1 = 273K (S.T)  P2 = 726mmHg T2 = P2V2T/  P1V1  = 726 x 1000 x 273  760 x 760  = 343.1K  **Example 2**  A given mass of a gas occupies 850cm3 at 320K and 0.92 x 105Nm-2 pressure. Calculate the volume of the gas at s.t.p.  SOLUTION  P1V1 = P2V2 /  T1 T2  P1 = 0.92 x 105Nm-2  V1 = 850cm3  P2 = 1.01 x 105Nm-2  V2 = ?  V2 = P1VT2/  P2T1  = 0.92 x 105 x 850 x 273  1.01 x 105 x 320  = 660.5cm3 | The students ask questions for further clarification. | To create room for slow learners. |
| **Evaluation** | 1. State the Boyle's law. 2. State the Charles law. 3. State the general gas equation. | The students attempt the questions. | To ascertain their level of understanding. |
| **Conclusion** | The teacher concludes by coping the note on the board. She checks and marks the note. | The students copy the note on the board. | For future use. |
| **Assignment** | 1. 130cm3 of gas at 20 degree C. exerts a pressure of 750mmHg. Calculate its pressure if its volume is increases to 150cm3. | The students did and submit their assignment for marking and correction. | To encourage the students to study at home. |